

# **APPENDIX 4.1-13**

## ***Land Exchange Alternative Mineral Resources Report***



MINERAL RESOURCE TECHNICAL REPORT  
OTAY RANCH, VILLAGE 14  
LAND EXCHANGE ALTERNATIVE  
SAN DIEGO COUNTY, CALIFORNIA

Prepared for:

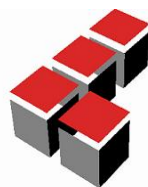
**JACKSONPENDO DEVELOPMENT**

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Project No. 11552.001

October 31, 2017



Leighton and Associates, Inc.

A LEIGHTON GROUP COMPANY



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To: JacksonPendo Development  
2245 San Diego Avenue, Suite 223  
San Diego, CA 92110

Attention: Mr. Jim Jackson

Subject: Mineral Resource Technical Report, Otay Ranch, Village 14, Land Exchange Alternative, San Diego County, California

In accordance with your request, we have performed a review and prepared this Mineral Resource Technical Report for the Otay Ranch Village 14 and Planning Areas 16 and 19 properties of the Land Exchange Alternative located in the Proctor Valley area of San Diego County, California.

Based on the results of our research and review, the site is similar to much of southwestern San Diego County in that it is underlain by Quaternary alluvium and metavolcanic rock that may possibly be mined and processed and utilized as a source of sand, gravel, and rock. We note that the northern most portion of the Land Exchange Alternative within 1,300 feet has been locally classified by the State of California as a Mineral Resource Zone MRZ-3, and the Land Exchange Alternative is bisected by a Quaternary alluvial stream deposit; both of which indicate the potential for mineral resources in the form of aggregate materials. Nevertheless, while the Land Exchange Alternative will encroach into these areas, it is in an area incompatible to mining, making resources not recoverable. It should also be noted that within the MRZ-3 zone, rock

deposits are highly weathered and of a substandard quality. Elsewhere, alluvial deposits are considered of substandard gradation. In addition, much of the alluvial deposits are located within an open space for sensitive environmental resources buffer area which would preclude mining of the alluvial resource. The majority of the site area also remains as open space and is outside of the Production-Consumption Boundary mapped by the County (1996).

When quantified relative to the entire extent of similar geologic exposures found across the eastern San Diego County, site development could be considered of negligible relative loss.

This report has been prepared for submittal to the County of San Diego, per the County of San Diego Land Use and Environment Group's Guidelines for Mineral Resource Technical Report Format and Content requirements.

If you have any questions regarding our report, please contact this office. We appreciate this opportunity to be of service.

Respectfully submitted,

LEIGHTON AND ASSOCIATES, INC.



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## 1.0 EXECUTIVE SUMMARY

In accordance with your request and authorization, this report was prepared to evaluate potential impacts to mineral resources due to implementation of the Otay Ranch – Village 14 EIR - Land Exchange Alternative as depicted in Figures 1 and 2 (Site Location Map and Project Overview Map). This report provides a discussion of the Land Exchange Alternative and existing site conditions; a description of site geologic conditions and mineral resource potential; a discussion of relevant mineral resource regulations and guidelines; an evaluation of the significance of impacts to local mineral resources due to implementation of the Land Exchange Alternative; and a discussion of mitigation measures that may be necessary to reduce the impact on mineral resources to a less than significant level.

The Land Exchange Alternative encompasses approximately 2,387 acres in the Otay area of unincorporated San Diego County and is part of the overall Otay Ranch, an approximately 23,000 acre master-planned community in southern San Diego County. The Land Exchange Alternative proposes to develop the property with single-family residential neighborhoods, mixed-use commercial areas, community and public safety facilities, an elementary school, parks, open space and MSCP Preserve, and associated onsite and offsite circulation.

Our analysis of potential impacts to mineral resources included a review of State and County technical guidance documents, mineral resource classifications and maps, local land use plans, and site specific geologic and geotechnical data.

Based on the results of this research and review, the site is similar to much of southwestern San Diego County in that it is underlain by shallow alluvium and weathered metavolcanic rock that could possibly be mined and processed and utilized as a source of sand, gravel, and rock. As the Land Exchange Alternative site is similar to much of the regional area, it is not unique in this regard. Previous geotechnical studies of the Land Exchange Alternative, include mapping (AGS, 2017a, 2017b) that indicate the limited extent of workable surficial and alluvial deposits, and the weathered nature of the underlying metavolcanic rock. In addition, a 6 acre portion of the northern most Land Exchange Alternative is located within a 1,300 foot buffer that is categorized as MRZ-3 due to the proximity of granitic rock in the area. It should be noted that the Land Exchange Alternative site is not being used currently for extraction. With the widespread



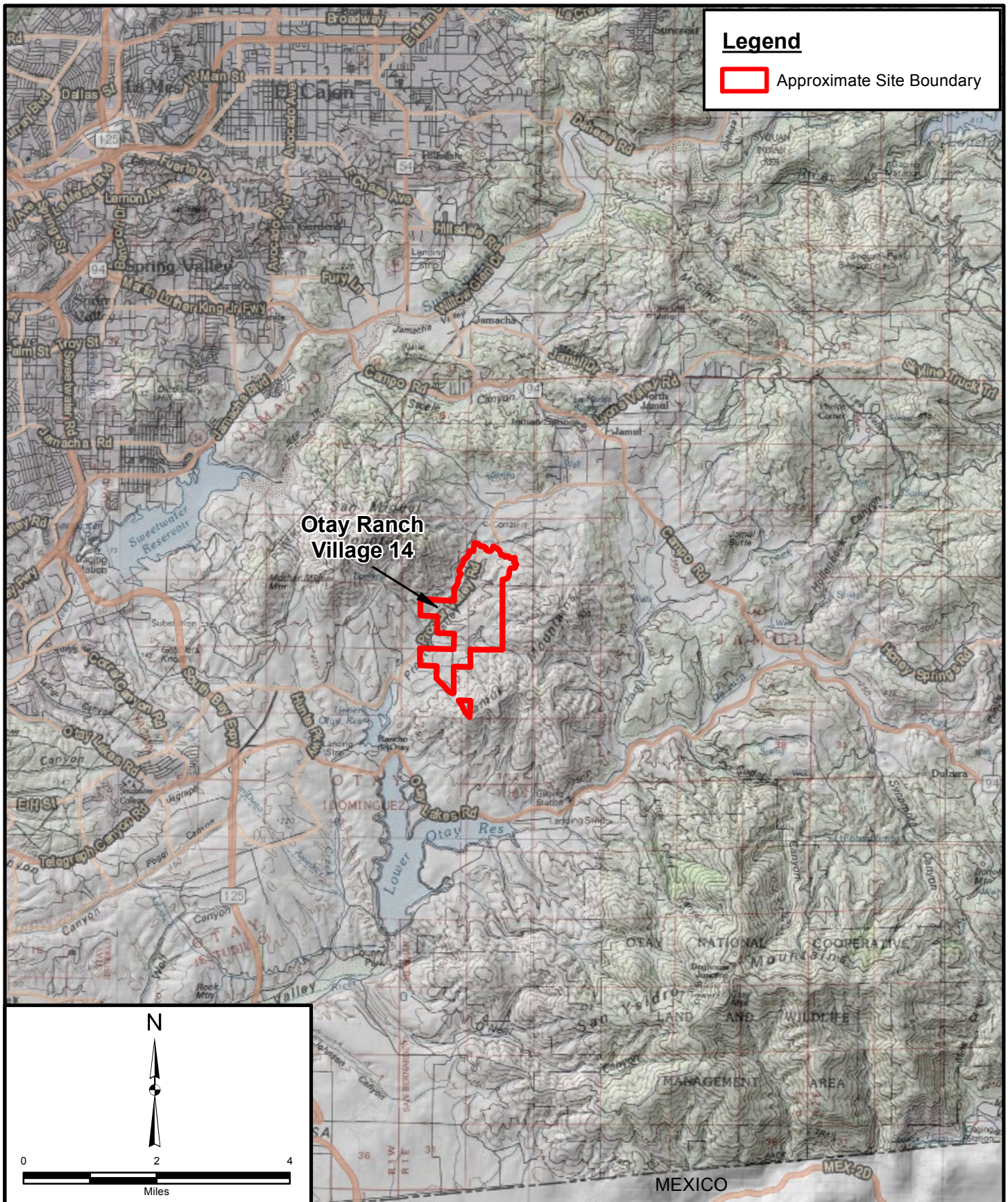
nature of similar geology comprising most of southwestern San Diego County, the site is not viewed as a unique critical resource from a geotechnical perspective. Areas similar in geologic composition to the subject site continue to exist as MRZ-3 zoned areas due to the lack of petition to the state Geologist for redesignation.

The Land Exchange Alternative contains no areas currently classified as MRZ-2. However, lacking substantial laboratory confirmation testing (i.e. grainsize analysis) of questionable quality Quaternary alluvium, the Quaternary alluvium may still be considered consistent with a MRZ-2 resource for this study.

Specifically, 173 acres of area underlain by alluvium located within 1,300 feet of the Land Exchange Alternative are currently located within both City MSCP Cornerstone Lands and County MSCP Preserve areas and are therefore already lost due to the above noted incompatible land use. In addition, we find that approximately 37 acres of questionable quality alluvial deposits may be considered by the County as an economic loss even in light of the fact that the deposits are not located with “relatively fast access to Interstates and/or State routes to economically bring the product to market” (County of SD, 2008).

Although, the value of the resource slightly exceeds the County’s definition of a significant impact, based on the items above (quality and transportation access), it is our professional opinion that the impacts to mineral resources regarding Quaternary alluvium as a result of the Land Exchange Alternative are not considered significant.





Project: 11552.001 Eng/Geol: WDO/RCS

Scale: 1" = 2 miles Date: October 2017

Base Map: Bing Maps 2017  
Thematic Information: Leighton  
Author: (mmurphy)

## SITE LOCATION MAP

Land Exchange EIR Alternative Mineral Analysis  
Otoy Ranch Village 14  
San Diego County, California

Figure 1



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## 2.0 INTRODUCTION

### 2.1 Purpose and Scope

The Land Exchange Alternative site has been classified by the California Department of Conservation – Division of Mines and Geology (Update of Mineral Land Classification: Aggregate Materials in the Western San Diego Production-Consumption Region, 1997) as an area of “Potential Mineral Resource Significance” (MRZ-3). The County of San Diego has requested that a Mineral Resource Investigation Report be prepared to investigate mineral resources on and within 1,300 feet of the site to determine if they are significant, if their access would be permanently lost, and whether the loss would be considered significant under CEQA. This report presents the results of our review and assessment of the mineral resources for the 1,003-acre site in the southwestern area of San Diego County, California, as depicted in Figure 1 and 2 (Site Location Map and Project Overview Map). The scope of services included:

- A review of in-house geotechnical reports and aerial photographs pertinent to the area (Section 5.0).
- A reconnaissance of the site.
- Review of the site location relative to the current Mineral Resource Zonation (MRZ) and designations per the California Surface Mining and Reclamation Act (SMARA) of 1975.
- Preparation of this report summarizing the results of our technical study, including:
  - A discussion of the MRZ's located on, adjacent, and within the vicinity of the Land Exchange Alternative.
  - A discussion of all mine; quarries, and gemstone deposits (both historic and existing) within the vicinity of the Land Exchange Alternative.



- A discussion of the regional and local geologic setting as it pertains to any mineral resources identified.
- Analysis of on-site and off-site impacts to the mineral resource, including indication of whether any mineral resources on the Land Exchange Alternative site would be minable, processable, and marketable in the near future.
- A discussion of the economic value and significance of any impacts (if present) considering land use compatibility with the Land Exchange Alternative.
- A discussion of any appropriate mitigation measures and project design considerations.

## 2.2 Land Exchange Alternative Location and Description

The Land Exchange Alternative is located within Otay Ranch Village 14 and Planning Areas 16 and 19 in the Proctor Valley Parcel of Otay Ranch as depicted on Figure 1. Village 14 and Planning Areas 16 and 19 are part of the larger Otay Ranch, an approximately 23,000-acre master-planned community in southern San Diego County designed as a series of villages and planning areas.

The Land Exchange Alternative proposes 1,530 homes within a development footprint that is limited to Proctor Valley Village 14 as depicted on Figure 2. The majority of Planning Areas 16 and 19 would be converted to MSCP and Otay Ranch RMP Preserve and would not be developed as depicted on Figure 3.

The “Land Exchange Area” is located within Otay Ranch Village 14 and Planning Areas 16 and 19 as depicted in Figure 3. The total Land Exchange Area covers approximately 2,387 acres, of which the Applicant owns 1,294 acres, the State owns approximately 1,053 acres and 39.9 acres are Offsites. Within the Land Exchange Area, there are 1,003 acres in Village 14 and 1,345 acres in Planning Areas 16 and 19. Offsites include Proctor Valley Road and related utilities in the south and central portions of Village 14. The State's ownership is included in order to process a General Plan Amendment to remove existing approved Otay Ranch



GDP/SRP and County General Plan development land uses and convert these acres to MSCP/Otay Ranch RMP Preserve.

The underlying purpose of the Land Exchange Alternative is to implement the adopted Otay Ranch General Development Plan/Subregional Plan, Volume II (County of San Diego 1993), ("Otay SRP") and complete the planned development within Jackson Pendo Development Company's ("Applicant") ownership of Village 14 and Planning Areas 16/19. The Otay SRP is also a component part of the County General Plan (County of San Diego 2011) and allows for a total of 2,123 homes in Otay Ranch Village 14 and Planning Areas 16/19.

The adopted Otay Ranch GDP/SRP requires the preparation of a Site Utilization Plan that describes proposed land uses. Figures 3 and 4 depict the proposed Surrounding Land Use and Site Utilization Plan for the Land Exchange Alternative.

In summary, the Land Exchange Alternative includes approximately 511 acres designated for 1,530 homes, 1,124 of which would be traditional single-family homes, 283 would be single family age-restricted and 123 would be multifamily homes. 18 neighborhoods are planned with approximate densities ranging from 1.5 to 15.0 dwelling units per acre. The age-restricted neighborhoods would be gated, as would four of the single-family neighborhoods situated on the largest lots.

Village 14 in the Land Exchange Alternative is planned around a Village Core, centrally located in the heart of the village. Higher density residential uses will be adjacent to the Village Core with single family residential radiating out in decreasing density. The Village Core is comprised of the Neighborhood Center which includes an 8-acre elementary school; a 4-acre Village Green (public park); a 3-acre Mixed Use Site with up to 15,000 square feet of commercial/retail uses and 54 multi-family homes; and a 2-acre Village Square Community Facility. The Village Core also includes a 2-acre public safety site for a fire station and satellite sheriff's facility and 69 multi-family townhomes located adjacent to the public safety site.

The Land Exchange Alternative is designed around an active lifestyle and wellness recreation theme and includes an extensive park and recreation system including four public parks totaling 13 acres as depicted on Figure 4. The remaining private recreation facilities include three private swim clubs, a senior activity center, the Village Square community facility and numerous pocket parks totaling



approximately 9 acres. Approximately 4.6 miles of community pathway are proposed on the Proctor Valley Road. Approximately three miles of Park-to-Park Loop connect to the regional pathway.

After implementing the proposed land exchange agreement, MSCP preserve boundary adjustment, and General Plan Amendment, the Land Exchange will include 1,749 acres of land for preserve open space, consisting of 404 acres in Proctor Valley Village 14, and 1,345 acres in Planning Areas 16 and 19.

In addition, it should be noted that the Proposed Project includes three options for internal circulation: (1) the Proctor Valley Road North Option, (2) the Preserve Trails Option and (3) the Perimeter Trail Option. The Draft EIR Land Exchange Alternative assesses each of these options and their respective impacts. Each of the options summarized below. For detailed descriptions with exhibits, see the Specific Plan Section VIII. Internal Circulation Options.

**Proctor Valley Road North Option:** The Proctor Valley Road North Option applies to Proctor Valley Road Street Section 10 at the northerly edge of Village 14. Street Section 10 would be replaced with Street Section 10B to provide for two dedicated bike lanes (one on each side of the road) instead of the “sharrows” proposed in the Land Exchange Alternative. Note that Street Section 10A provides a transition section at the northerly property boundary and does not change in the Option scenario. Generally, the Proctor Valley Road North Option would increase the right-of-way width from 40 feet to 48 feet.

**Preserve Trails Option:** The Preserve Trails Option consists of two segments of existing, disturbed trails. These segments would be located within the Otay Ranch RMP Preserve. The Preserve Trails Option includes segments “A” & “B” as identified in the Otay Ranch GDP/SRP, which are also identified as segments 52& 49 in the County of San Diego’s Community Trails Master Plan (CTMP). Segment “A”/“52” is 4,450 lineal feet, generally located at the northern terminus of Village 14 and extending northeast through the onsite Otay Ranch RMP Preserve to the eastern edge of the Echo Valley loop (CTMP Trail 53). Segment “B”/“49” is approximately 3,100 lineal feet and is located between South and Central Village 14, along an existing, historic ranch road. This trail is located within onsite Otay Ranch RMP Preserve and bisects regional wildlife corridor R1. The Preserve Trails Option would retain these portions of trails in their existing conditions, which meet the CTMP primitive trail standard. No improvements to these Preserve Trails are



contemplated.

**Perimeter Trail Option:** The Perimeter Trail Option is an approximately 4.5-mile perimeter trail located within the Development Footprint of Village 14. The Perimeter Trail Option is situated primarily within the Otay Ranch RMP 100-foot Preserve Edge. The Perimeter Trail Option is designed to CTMP primitive trail standards, and the trail tread varies from 2-6 feet. Due to topography, trail grades range from 2% to the maximum grade allowed of 30%. The Perimeter Trail Option requires the construction of approximately 5,200 lineal feet (1.0 mile) of 5 to-7-foot-high retaining walls due to steep topography and drainage constraints. The Perimeter Trail Option would be graded as part of overall project grading and does not encroach into the Otay Ranch RMP Preserve. The perimeter trail would be accessed at public parks and trailheads and would be maintained by the County of San Diego.

Leighton and Associates has evaluated these options and they are not material to the information presented in this technical report.

### 3.0 EXISTING CONDITIONS

#### 3.1 Topographic Setting

The Land Exchange Alternative is located within Township 17 South, Range 1 East, Sections 17, 18, 19, 20, and 30 on the USGS 7.5' Jamul Mountains quadrangle, generally along Proctor Valley Road between the City of Chula Vista and Jamul, California. The Project Area is more specifically located within Otay Ranch Village 14 and Planning Areas 16/19 as depicted in Figure 1 and 2 (Site Location Map and Project Overview Map).

The total Project Area encompasses approximately 1,003 acres within Otay Ranch Village 14. The Land Exchange Alternative area is in a natural state and is covered with a light to dense growth of annuals and some chaparral. A network of improved and unimproved roads provides access throughout the site.

Topography on site ranges from gently sloping terraces to moderately steep existing natural slopes approaching 1:1 (horizontal to vertical) slope inclinations. Two southerly flowing active drainages transect the site ultimately converging into a broad drainage adjacent to the existing Proctor Valley Road which drains into Upper Otay Lake. The existing elevations within the Land Exchange Alternative range from a high of approximately 1,050 feet above mean sea level (AMSL) in the northeastern portion of the site to a low of approximately 595 AMSL within an active drainage near the southern limit of Land Exchange Alternative.

#### 3.2 Mineral Resource Potential

As mandated by the Surface Mining and Reclamation Act of 1975, the California State Mining and Geology Board classifies California mineral resources with the Mineral Resource Zones (MRZs) system. These zones have been established based on the presence or absence of significant sand and gravel deposits and crushed rock source area, e.g., products used in the production of cement. The classification system emphasizes Portland Cement Concrete (PCC) aggregate, which is subject to a series of specifications to ensure the manufacture of strong durable concrete. The following guidelines are presented in the mineral land classification for the region (CGS, 1982 and 1996b).



- MRZ-1 - Areas where adequate geologic information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.
- MRZ-2 - Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that there is a high likelihood for their presence.
- MRZ-3 - Areas containing mineral deposits, the significance of which cannot be evaluated from available data.
- MRZ-4 - Areas where available information is inadequate for assignment to any other MRZ zone.

The Land Exchange Alternative is located within southwestern San Diego County which includes zones classified as MRZ-2 as shown in gray on Figure 5 (Highlighted Mineral Resource Zones). It should be noted that the Land Exchange Alternative does not contain MRZ-2 zones within or adjacent to the boundaries; the closest MRZ-2 zone to the Land Exchange Alternative is located to the southeast roughly 2.0 miles away (see Figure 6). The vast majority of existing MRZ-2 zones are mapped in Quaternary alluvial areas and Tertiary conglomerate deposits and therefore have irregular, organic limits defined by low-lying topographic drainages. Geologically, these areas are generally characterized by the presence of younger (Quaternary-aged) river channel, floodplain, and terrace deposits that have been eroded from the older (Tertiary to Cretaceous-aged) bedrock units, transported, and re-deposited. They consist of naturally loose mixtures of sands and rounded gravels. Laboratory testing has also confirmed the physical and chemical characteristics of these mapped deposits are appropriate for PCC-grade aggregate.

In contrast, the Land Exchange Alternative is located in an entirely different geologic province typical of the MRZ-2 zone described above in that it is a predominantly a metavolcanic rock site, with an MRZ-3 zone defined by generally granitic geologic unit limits along the north boundary of the site (Figure 6). In addition, the Land Exchange Alternative is located east and outside of the P-C Boundary which is an uncategorized zone. Specifically, all of Otay Ranch Village 14 is entirely located in the uncategorized zone (Figure 6). Documented historical aggregate extraction operations have not been identified on the site.

It should be noted that the majority of the western San Diego region is mapped





as a MRZ-3 zone (San Diego County, 2008). Generally, these areas geologically consist of the older bedrock units, including the crystalline and metavolcanic rocks that are mapped over nearly two thirds of the San Diego County. These areas are also commonly rugged mountainous terrain relatively isolated from existing development and infrastructure. As noted in the updated 1996 DMG classification report, these materials can be crushed to yield PCC-grade aggregate provided they possess the appropriate chemical characteristics. Despite considerable costs associated with crushing, additional processing, and transportation, crushed rock has been a feasible source when more economical alluvial materials are not readily available.

Reclassification of an MRZ-3 zone to a MRZ-2 designation is under the purview of the California State Geologist. The criteria includes determination that the “deposit is minable, processable, and marketable under the technologic and economic conditions that exist at present or which can be estimated to exist in the next 50 years and meets or exceeds (in 1996 equivalent dollars) \$12,150,000 for construction materials (DMG, 1996b). Note this equated to \$5,000,000 in 1978 dollars when the guidelines were first written.

It should be further noted that the lands surrounding the Land Exchange Alternative, including the land within 1,300 feet of the site boundary (Figure 8), are encompassed within the City of San Diego’s (City) Multiple Species Conservation Program (MSCP) Subarea Plan (City MSCP, 1997) and the County’s Final MSCP Plan (County MSCP, 1998). The goal of the City’s MSCP is to provide for the permanent protection of plant and wildlife species within the Multi-Habitat Planning Area (MHPA). The City’s MSCP contains General Planning Policies and Design Guidelines to be applied in the review and approval of development projects within or adjacent to the land within the Multi-Habitat Planning Area (MHPA), (City MSCP, p. 43.). The lands surrounding the Land Exchange Alternative are incorporated into the City’s MSCP by way of the Cornerstone Lands Conservation Bank Agreement (“Cornerstone Lands”). The relevant Cornerstone Lands surrounding the Land Exchange Alternative consist of approximately 1,800 acres of watershed management lands near portions of Upper and Lower Otay Lakes. The Cornerstone Lands are subject to the City’s MSCP General Planning Policies and Design Guidelines requiring the review and approval of projects within or adjacent to the Cornerstone Lands. For mining operations, the City’s MSCP states “[n]ew or expanded mining operations on lands conserved as part of the MHPA are incompatible with MSCP Preserve



goals for covered species and their habitats unless otherwise agreed to by the wildlife agencies at the time the parcel is conserved.” (City MSCP, p. 45.) Likewise, the County’s MSCP Plan has an identical land use restriction on new or expanded mining activities unless otherwise agreed to by the wildlife agencies at the time of conservation. (County MSCP, p. 6-5.) No wildlife agency has agreed to allow for any new or expanded mining activities in either the City’s MSCP or the County’s MSCP Preserve areas. For this reason, the lands surrounding the Land Exchange Alternative cannot be subject to new or expanded mining activities. The Project Area is adjacent to and includes both City MSCP Cornerstone Lands and County MSCP Preserve areas; therefore, the mineral resources within the 1,300-foot buffer zone surrounding the Project Area are already considered to be lost due to the incompatible land uses (see areas classified as protected wildlife habitat on Figure 8)

### 3.2.1 Otay Ranch Village 14 Land Exchange Alternative

- As shown on Figure 5 and 6, the Land Exchange Alternative is located outside of the MRZ-3 Zone and is located entirely within the Uncategorized (outside of the PC Boundary) Zone. The Land Exchange Alternative generally consists of a mountainous terrain although bisected by an alluvial stream valley and is within 1,300 feet of a mapped MRZ-3 Zone (6 acres). Therefore, the Land Exchange Alternative could have a resource designation of MRZ-3, from the presence of metavolcanic rocks and alluvial stream valley.

### 3.3 Geology

Otay Ranch Village 14 is located in the lower Peninsular Range Region of San Diego County, a subset of the greater Peninsular Ranges Geomorphic Province of California. The Peninsular Ranges Geomorphic province is approximately bounded to the east by Elsinore Fault Zone, to the north by the Transverse Ranges, the south by Baja California, and to the west by the Pacific Ocean.

This portion of the Peninsular Ranges is underlain by Jurassic and Cretaceous plutonic rocks of the Peninsular Ranges Batholith, which contains variably metamorphosed Mesozoic rocks. These basement rocks are non-conformably overlain by a thick sequence of relatively undisturbed sedimentary rocks ranging from upper Cretaceous to Pleistocene in age.



The Project Area is located near the eastern edge of the coastal plain at the contact with the metavolcanic rocks of the Jamul Mountains. Geologically, the project site is underlain by two principle rock types, the Late Jurassic to early Cretaceous aged metavolcanic rocks of the Santiago Peak Volcanics and the Tertiary aged sedimentary rocks of the Otay Formation. The Otay Formation is informally subdivided into three subunits: an upper sandstone-claystone member; a middle gritstone member; and, a basal angular-clast fanglomerate member. Minor exposures of upper Pleistocene older alluvium exist locally as relatively flat lying river terraces and unconsolidated alluvium of Holocene age occupies the active drainages onsite.

A basement complex consisting of Mesozoic-aged prebatholithic volcanic and metavolcanic rocks underlies the Land Exchange Alternative at depth and are exposed at the surface at higher elevations in the easterly and northerly portions of the Land Exchange Alternative. The basement rocks are non-conformably overlain by Tertiary-aged sedimentary bedrock, which is subsequently mantled by Quaternary-aged surficial soil units. Approximate geologic contacts are shown on Figure 7. A brief description of the units mapped across the site is presented in the following sections.

### 3.3.1 Surficial Units

Surficial units onsite include undocumented artificial fill (Afu), topsoil/colluvium (unmapped), young alluvium (map symbol Qya), and older alluvium (map symbol Qoa). More detailed descriptions of these units are presented below.

#### *Artificial Fill (Afu)*

Artificial fill soils were observed locally at the Land Exchange Alternative site. The undocumented fills are primarily located along the current alignment of Proctor Valley Road as embankment fills for the road and associated culverts. Based on limited observed exposures, these materials can generally be described as clayey to gravelly sands with abundant rock fragments in a dry to slightly moist and loose to moderately dense condition. In addition, minor undocumented fills exist locally across the site as unimproved trails



and roads. In consideration of the limited extent of the material and the plan scale, these fills are not mapped.

*Topsoil/Colluvium (not mapped)*

Undifferentiated topsoil and colluvium exist throughout the Land Exchange Alternative site as a thin soil veneer. Thicker accumulations commonly occur near the base of slopes and natural topographic swales. As encountered, these materials ranged from less than one foot to four feet in thickness and are generally composed of silty to clayey sand and sandy clay in a dry to slightly moist and loose to moderately dense condition. Roots and minor to moderate porosity are common.

*Alluvium (Qya)*

Young alluvial deposits occupy the bottoms of the primary and tributary drainages onsite. These materials can generally be described as silty to clayey sand with gravel and small rock fragments in a dry to moist and loose condition and sandy clay in a moist and soft condition.

*Older Alluvium (Qoa)*

Older alluvium occurs onsite as moderately dissected terraces that flank modern drainage channels/valleys. The older alluvium consists of poorly bedded, poorly to moderately well consolidated sand to boulder-sized sediment in a clayey sand matrix. Clasts are generally subangular to subrounded. Matrix soils are commonly rubified and locally exhibit weak cementation.

### 3.3.2 Bedrock Units

*Otay Formation – Fanglomerate (Tof)*

The Otay Formation - Fanglomerate underlies much of the Project Area and occupies the lower flanks and valleys of the highlands to the east and north of the Project Area. The fanglomerate has a more subdued topography and is moderately to highly dissected.



This unit is typified by thickly to massively bedded breccia intertongued with a finer grained subunit consisting of claystone and sandstone. The breccia subunit is generally in a slightly moist to moist and moderately hard to hard condition. The breccia subunit is also composed of subangular to angular, gravel to cobble size clasts in a clayey sand matrix. Occasional to common boulder sized clasts were encountered in the borings and excavator test pits. Rock clasts appear to be locally derived from the Santiago Peak Volcanics. The clay matrix is commonly waxy, highly expansive, and is likely bentonitic. The finer grained subunit is generally comprised of olive gray to pale brownish yellow, sandy claystone and clayey sandstone in slightly moist to moist and soft to hard condition.

#### *Santiago Peak Volcanics (KJm-v)*

The site is underlain by Jurassic-aged Santiago Peak Volcanics at depth and outcrops at the surface primarily in the eastern and northern portions of the site. The contact between the Santiago Peak Volcanics and the overlying younger geologic units represents a significant geologic hiatus. This contact is irregular and reflects a relatively high relief Mesozoic landscape. Subsequent erosion has exhumed portions of this ancient landscape, creating modern topographic highs including San Miguel Mountain to the north and the Jamul Mountains to the east.

The Santiago Peak Volcanics are generally dense and mildly metamorphosed volcanic rocks. Composition of the volcanic rocks varies from basalt to rhyolite but is predominantly dacite and andesite (Kennedy and Tan, 2008). Typically, the meta-volcanics display crude to moderate bedding and foliation. Fracturing is poorly to moderately well developed. In general, outside of boulder areas, a weathered halo of only a few feet thick exists. Below this, the rock is very dense and hard.



## 4.0 MINERAL RESOURCE IMPACT ANALYSES

### 4.1 Methodology for Determination of Significance – County Guidelines

Considering the site characteristics described above, their significance is measured against the County of San Diego Department of Land Use Guidelines For Determining Significance and Report Format and Content Requirements For Mineral Resources (“County Guidelines”) (DPLU, 2008). These characteristics are based on the State CEQA Guidelines, and establish a measurable standard for determining when an impact will be considered significant pursuant to CEQA.

Under the County Guidelines (County Guidelines, 2008, pp. 16-17.), a project would generally be considered to have a significant effect, if it proposes any of the following:

1. The project is:
  - On or within the vicinity (generally up to 1,300 feet from the site) of an area classified as MRZ-2; or
  - On land classified as MRZ-3; or
  - Underlain by Quaternary alluvium; or
  - On a known sand and gravel mine, quarry, or gemstone deposit; and

The project will result in the permanent loss of availability of a known mineral resource that would be of value to the region and the residents of the state; and The deposit is minable, processable, and marketable under the technologic and economic conditions that exist at present or which can be estimated to exist in the next 50 years and meets or exceeds one or more of the following minimum values (in 1998 equivalent dollars):

- Construction materials (sand and gravel, crushed rock) \$12,500,000.00.
- Industrial and chemical mineral materials (limestone, dolomite, and marble



[except where used as construction aggregate]; specialty sands, clays, phosphate, borates and gypsum, feldspar, talc, building stone and dimension stone) \$2,500,000.

- Metallic and rare minerals (precious metals [gold, silver, platinum], iron and other ferro-alloy metals, copper, lead, zinc, uranium, rare earths, gemstones, and semi-precious materials, and optical-grade calcite) \$1,250,000.00.
2. The project would result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Notably, the County Guidelines for Mineral Resources recognize that open space areas preserved for sensitive environmental resources effectively remove the ability for that land to be utilized for future extraction of mineral resources. (County Guidelines, 2008, p. 8.). Specifically, areas designated for the protection of sensitive environmental resources (Figure 8) that may be permanently inaccessible for future mining activities already contribute to a mineral resource loss. The Cornerstone Land MSCP Preserve area will be subject to a conservation easement upon conveyance. Therefore, the County Guidelines acknowledge that if a project site falls under Guidelines 1 and 2 and is already surrounded by residential, commercial, or other land uses that are incompatible to mining, the mineral resources for a project site and up to 1,300 feet from the project site boundary may not be considered a significant loss if the mineral resources have already been lost by those existing incompatible land uses (County Guidelines, 2008, p. 18.).

#### 4.2 Impact Analysis

The following analysis utilizes County Guidelines dated July 30, 2008. Based on our use of those guidelines and our study, we conclude that no significant impact will occur from the Land Exchange Alternative. Specifically, no known mapped industrial and chemical materials nor metallic and rare minerals are known in the Land Exchange Alternative Area and within the setback determination area as shown on Figure 8. The Sections below provide the specific results of our determination of significance for the Land Exchange Alternative.



#### 4.2.1 Land Use Compatibility

The remaining guideline for significance determination involves whether or not the deposit is minable or compatible under the present conditions, or conditions estimated to exist within a 50-year time-frame. In order to be minable, it must be considered compatible with existing land uses, and land uses projected along the 50-year future time line.

The Land Exchange Alternative property is located in an undeveloped area. As shown on Figure 2, surrounding land uses include open-space for sensitive environmental resources. Figure 8 illustrates those portions of the Land Exchange Alternative that are within areas where a 1,300 foot buffer would apply. Note that only a small 6 acre portion of the northern area encompassed by the buffer is within the mapped MRZ-3 zone.

In addition the within and surrounding the Land Exchange Alternative are lands encompassed within the City of San Diego's MSCP Subarea Plan (City MSCP) and the County's MSCP Subarea Plan, and mining operations in those areas are restricted (Figure 8). For those areas that lie within the jurisdictional boundaries of both MSCPs, they are conserved and new or expanded mining activities are **incompatible** with the preserve goals. (City MSCP, p. 45; County MSCP, p. 6-5; and County Guidelines, 2008, p. 18.) Therefore, the mineral resources within the 1,300 foot buffer zone surrounding the Land Exchange Alternative that are within the MSCPs, are not considered a significant mineral resource loss since they already have been lost by the existing incompatible land uses.

As mentioned above, a small portion of the Land Exchange Alternative (6 acres) will impact the mapped MRZ-3 resulting in that portion being lost to possible future mining efforts. However, due to the weathered nature of the impacted mapped metavolcanic rock, it is our professional opinion that the metavolcanic rock is not considered a quality minable resource based on the discussion below.

In addition, when the Land Exchange Alternative's development is completed, the main Quaternary alluvium of the Proctor Valley area will be





lost to possible future mining efforts. However, based on the relatively minor volume of Quaternary alluvium the deposit is not considered marketable regardless of lacking substantial laboratory confirmation testing (i.e. grainsize analysis) of the Quaternary alluvium. Nevertheless, additional analysis regarding the marketability of the Quaternary alluvium is provided in the section below.

#### 4.2.2 Marketability and Minimum Dollar Value

As stated previously, portions of the Land Exchange Alternative and within 1,300 feet are classified as both MRZ-3 and are uncategorized (outside P-C Region Boundary) with Quaternary alluvium. Based on our analysis, approximately 6 acres mapped as MRZ-3 would be lost by construction of the development (Figure 8). As previously mentioned in the text above, the metamorphosed volcanic rock deposit located within the MRZ-3 zone is not considered minable, processable, or marketable under the technologic and economic conditions existing today or that can be estimated 50 years from today. In order to mine such materials deep removals of overburden generally greater than 20 feet are necessary and only then may limited hard rock of adequate quality for mining purposes be exposed. In addition, the Land Exchange Alternative is not located near adequate access for transportation. Considering the above conditions, the marketability is considered nil and the minimum dollar value of the deposit therefore is not determined.

The entire area mapped as Quaternary alluvium (Qya) on the Regional Geologic Map (Figure 7 and 8) could also be considered a mineral resource based on Section 4.0 of the County Guidelines (2008). However, based on our review, we find that the mapped Quaternary alluvium is generally not consistent with significant Quaternary alluvial deposits associated with MRZ-2 and other previously mapped aggregate resource areas since it predominantly consists of fine sands, silts, and clays, with a lack of significant gravels. Nevertheless, as mentioned above, lacking substantial laboratory confirmation testing (i.e. grainsize analysis) of the Quaternary alluvium, the Quaternary alluvium may be considered consistent with a MRZ-2 resource for this study. Currently, approximately 37 acres of the resource will be lost due to the proposed



development (Figure 8).

Assuming hypothetically, that the Quaternary alluvium is consistent with a MRZ-2 zone and based on our site observations and the results of the (AGS, 2017a, 2017b) geotechnical report, we estimate the Quaternary alluvium could be removed to an average depth of roughly 10 feet below the ground surface amounting to roughly 886,500 tons of sand and aggregate. Assuming a price of \$20.00 per ton, a density of 0.055 tons per cubic foot and a waste factor of approximately 20 percent, the value of material lost would be roughly \$14,200,000 which would exceed the threshold (\$12,500,000) for the County's definition of a significant impact. As mentioned above, the MRZ-3 resource marketability is considered nil and the minimum dollar value of the deposit therefore is not determined.

Our price estimate above is based on resource prices (Hanson 2016 – Slaughterhouse Canyon Soils; and Vulcan verbal communication, 2016 – Carrol Canyon) for sand and aggregate material (\$20.00 per ton).

## 4.3 Conclusions

### 4.3.1 Significance of Impacts

Based on our analysis, the project under Significance Guideline 1 would not be considered a significant mineral resource. The Land Exchange Alternative site is not located on or within 1,300 feet of land classified as MRZ-2, and is not on a known sand and gravel mine, quarry, of gemstone deposit.

The Land Exchange Alternative site is partially located on land classified as MRZ-3. However, based on the mapped geology, it is our opinion that the land classified as MRZ-3 at the project would not be reclassified as MRZ-2 because the geology consists of metavolcanics and not granite. Specifically, the observed metavolcanics are highly weathered at the surface. Accordingly, it is our professional opinion, based on mapping and experience, at least 20 feet of overburden overlies suitable, unweathered materials for mining. In addition, the metavolcanics are also generally highly fractured and; therefore, are considered of generally low quality for use as



construction material.

The Land Exchange Alternative site is partially underlain by Quaternary alluvium. However, based on our field mapping of the alluvium, we estimate that waste factors will exceed the assumed 20 percent that most commercial quarries consider when looking at economic feasibility. These elevated waste factors are related to the generally fine grained nature of the alluvium observed throughout Proctor Valley. When combined with the shallow topographic geometry of Proctor Valley, this elevated waste factor supports the opinion that the alluvial deposit would not be reclassified as MRZ-2. Further, as described below, the mapped alluvium is located generally within and adjacent to existing designated environmentally sensitive Preserve areas, which makes it an unfavorable mining resource and may already be considered incompatible to mining.

As noted above, potential mineral resources shown in Figure 8 are within areas identified as Preserve by several controlling habitat conservation plans. These include the County of San Diego MSCP, City of San Diego MSCP, and the Otay Ranch Resource Management Plan. While not necessarily precluded by these habitat conservation plans, mining within a Preserve area requires compliance with the controlling document(s) and appropriate permitting. For these reasons, mining the resources shown in Figure 8 may not be compatible with existing and planned land uses. (See County of San Diego CEQA Significance Guidelines – Mineral Resources, pp. 8, 15.)

For example, the largest area of potential mineral resources in the southwest portion of Proctor Valley is owned and managed as “Cornerstone Lands,” pursuant to the City of San Diego MSCP. As defined by Section 1.2 of the City of San Diego MSCP, these lands are owned by the City of San Diego Water Department and the City of San Diego’s Charter “restricts the use and disposition of water utility assets.” To comply with the requirements of the City of San Diego MSCP and the City Charter, “the City of San Diego intends to enter into a Conservation Land Bank Agreement with the wildlife agencies for the Cornerstone Lands,” through which “the City will commit to phasing in conservation easements over all 10,400 acres of the Cornerstone Lands.” Implementation of conservation easements “will restrict those lands [including portions of the areas shown in Figure 8] from being



used for other purposes inconsistent with habitat preservation.”

Section 1.4.2 of the City of San Diego MSCP states “New or expanded mining operations on lands conserved as part of the MHPA are incompatible with MSCP preserve goals for covered species and their habitats” subject to permitting and concurrence by the Wildlife Agencies “at the time the parcel is conserved.” This would include assessing impacts and incorporating appropriate conditions to mitigate biological impacts, including impacts to covered species, and restoring mined areas. In addition, all other requirements of City of San Diego land use policies and regulations (e.g., Adjacency Guidelines, Conditional Use Permit) must be satisfied, and the mining operation shall meet noise, air quality and water quality regulation restrictions.

There are known sensitive resources on the lands owned by the City of San Diego and underlain by Quaternary Alluvium. These resources include a vernal pool restoration site, coastal sage scrub, Hermes copper habitat, and jurisdictional resources such as ephemeral drainages. In order to mitigate for impacts to these resources, appropriate permits would be required, including compliance with the requirements of the Federal government (Army Corps of Engineers), State of California (California Department of Fish and Wildlife) and Regional Water Quality Control Board (i.e., 401/404/1600 permits). Such permitting requirements would substantially limit if not entirely preclude these mineral resources from being mined due to the timeframe, costs, and probability of success in securing the appropriate approvals, especially in light of the geological constraints identified above.

With regard to Significance Guideline 2, based on our review, the project is not within a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

When quantified relative to the entire extent of similar geologic exposures found across eastern San Diego County, site development is considered a negligible relative loss of mineral resources.



#### 4.3.2 Mitigation Measures and Design Considerations

Approximately 6 acres of the Land Exchange Alternative is located in MRZ-3 and approximately 37 acres of Quaternary alluvium are located within the Land Exchange Alternative. Based on the items discussed above (quality and transportation access), it is our professional opinion that the impacts to mineral resources regarding MRZ-3 and Quaternary alluvium as a result of the Land Exchange Alternative are not considered significant.

Therefore, no mitigation measures or design considerations are required for the Land Exchange Alternative. Based on our analysis, the Land Exchange Alternative does not significantly impact existing mineral resources. It should be noted that the site is mapped outside of the P-C Region Boundary and is therefore uncategorized.

## 5.0 REFERENCES AND COMMUNICATIONS

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- Advanced Geotechnical Solutions, Inc. (AGS), 2017b, Geotechnical Review of Tentative Map and Grading Plan, Otay Ranch – Proctor Valley Village 14 and Planning Areas 16 & 19, County of San Diego, California, dated March 24, Report No. 1312-02-B-6
- California Geological Survey (CGS) (previously Division of Mines and Geology), 1982, Mineral Land Classification: Aggregate Materials in the Western San Diego County Production-Consumption Region, California, Kohler, S.L. and Miller, R.V. authors, CDMG Special Report 153.
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## REFERENCES AND COMMUNICATIONS (Continued)

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- Todd, V.R., Preliminary Geologic Map of the El Cajon 30'x60' Quadrangle, 2004, USGS OFR 2004-1361
- United States Geological Survey (USGS), 2002, The Mineral Industry of California: 2002 Minerals Yearbook.
- USGS Topographic Map of the Jamul Mountains 7.5' Quadrangle, San Diego County, California, 1994.
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- Weber, Harold Jr., 1958-59, Geology and Mineral Resources of San Diego County, California, Plate 1, Scale 1"=2 miles, dated 1958-59.



## REFERENCES AND COMMUNICATIONS (Continued)

### Aerial Photographs

Aerial Photographs Reviewed for Report			
Year	Flight ID	Photo ID	Photo Scale
1928	SD	69B- 1, 2, 3 69C- 1, 2, 3 69D- 1, 2, 3	1" = 1000'
1960-1970	SDCT2/T11	2- 74 14- 28, 29, 30	1" = 1000'
1968	AXN	3JJ- 101, 102, 175	1" = 2800'
1970	SDC	13- 7, 8	1" = 2000'
1971	GS-VCSQ	1- 5	1" = 2600'
1973-1975	SDPD	14- 11, 12, 13 15- 14	1" = 1000'
1974	SDC ORTHOS	Jamul Mtn.	1" = 2000'
1974	SDPD	2- 3,4	1" = 2000'
1976	SAN DIEGO	235, 236, 247, 248	1" = 2000'
1978-1979	SDCO (WEST)	33- F1,F2 34- D22, D23, D24	1" = 1000'
1983	C11109 (CAS)	139, 140	1" = 2000'
1989	WAC (WEST)	18- 49, 51	1" = 2640'

